

## **Development of performance-based bitumen specifications for the Gulf countries**

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**Abstract:** The rheological behaviour of bitumen has a great influence on the behaviour of bitumen mixtures. Bitumen plays a significant role in a pavement's ability to withstand thermal and fatigue cracking and contributes to permanent deformation behaviour. The current binder specifications, as applied in the Gulf countries including Saudi Arabia, Kuwait, Bahrain, Qatar, United Arab Emirates and Oman, are based primarily on either penetration or viscosity testing which does not properly account for pavement performance. This research was undertaken to provide a performance-based binder specification for the Gulf countries, based on the findings of the Strategic Highway Research Programme (SHRP) carried out in the United States, considering the prevailing environmental and traffic conditions and type of locally produced bitumen. Results indicated that locally produced 60/70 penetration grade bitumen satisfies the environmental condition of less than 30% of the Gulf countries' area. Air blowing of bitumen is required to satisfy the performance requirement of another 25% of Gulf countries area, while polymer modification is necessary to satisfy the performance requirements for the other parts of the Gulf countries which include eastern parts of Saudi Arabia, Kuwait, Bahrain, Qatar, United Arab Emirates and Oman. Â© 1997 Elsevier Science Ltd.